

REMARKS

As requested, the specification has been reviewed. The specification has been amended to make editorial changes therein to place the application in condition for allowance at the time of the next Official Action.

Claims 1-31 were pending and have been replaced with new claims 32-43. Consideration and allowance of the new claims are respectfully requested. The new claims are believed to be proper as to form and were drafted bearing in mind the rejection of claims 1-31 under §112, second paragraph

Claims 1-4, 6, 17-20, 22 and 31 were rejected as anticipated by AKIYAMA JP 2000-269576, and claims 1-31 were rejected as unpatentable over AKIYAMA in view of BARNES 5,128,949. Reconsideration and withdrawal of the rejections are respectfully requested in view of the new claims.

The new claims are directed to embodiments of the invention that include a solid-state laser medium that receives the pumping light and provides a laser oscillation light from ends thereof, two resonator reflective surfaces at respective ends of the laser medium and that reflect the laser oscillation light back to the ends, where laser medium is between and aligned with the two reflective surfaces so as to define an optical axis for the laser oscillation light through the ends and the reflective surfaces.

The apparatus (claims 32-39) includes a fluorescence detector that includes a fluorescence receiving surface that receives fluorescence emitted by the laser medium directly from one of the ends of the laser medium, where the fluorescence receiving surface is between the laser medium and one of the reflective surfaces and directly adjacent to the optical axis without blocking the optical axis. This is illustrated, by way of example, in Figure 3. The dependent claims include more particular embodiments illustrated in Figures 4-16.

The method (claims 40-43) includes the step of detecting fluorescence emitted by the laser medium directly from one of the ends of the laser medium, the fluorescence being detected with a fluorescence detector that includes a fluorescence receiving surface that receives the fluorescence, where the fluorescence receiving surface is between the laser medium and one of the reflective surfaces and directly adjacent to the optical axis without blocking the optical axis.

AKIYAMA discloses a conventional apparatus such as shown in Figure 1 of the present application. The reference does not disclose a fluorescence detector that includes a fluorescence receiving surface that receives fluorescence emitted by the laser medium directly from one of the ends of the laser medium, where the fluorescence receiving surface is between the laser medium and one of the reflective surfaces and directly adjacent to the

optical axis without blocking the optical axis. Indeed, AKIYAMA does not suggest placing anything between the laser medium and the reflective surfaces, and directly contradicts the claims herein by placing the reflector 28 directly in the optical path Q. Accordingly, the new claims avoid the rejection under §102.

BARNES also does not disclose a fluorescence detector that includes a fluorescence receiving surface that receives fluorescence emitted by the laser medium directly from one of the ends of the laser medium, where the fluorescence receiving surface is between the laser medium and one of the reflective surfaces and directly adjacent to the optical axis without blocking the optical axis. BARNES does not suggest placing anything between the laser medium and the reflective surfaces, and directly contradicts the claims herein by receiving fluorescence from the sides of the laser rod 13, rather than directly from the ends as claimed herein.

The combination of AKIYAMA and BARNES lacks any suggestion, motivation, teaching, or reason for placing the fluorescence receiving surface between the laser medium and one of the reflective surfaces and directly adjacent to the optical axis without blocking the optical axis so that the fluorescence receiving surface receives fluorescence emitted by the laser medium directly from one of the ends of the laser medium. Accordingly, the new claims avoid the rejection under §103.

By way of further explanation, in the fluorescence detector of the present invention, an optical component is inserted and arranged in the vicinity of an end surface of the laser rod in such a manner so as not to block the laser optical axis, so that an output variation in the laser diode is observed easily and precisely.

In contrast, in the apparatus disclosed in AKIYAMA, a mirror is inserted into the laser output optical axis so that the light is kicked out and monitored. Accordingly, although this configuration also permits the measurement of the laser output profile distribution, this measurement is not precisely performed on the output variation of each laser diode. This situation is pointed out in the specification of the present application. Further, the observed laser output profile can be adversely affected by variation in the alignment other than one in the laser diode output.

In the apparatus disclosed in BARNES, fluorescent light is monitored directly through the side surface of the laser rod. Nevertheless, with increasing laser output, an increasing number of laser diodes generally need to be provided on the side surface of the laser rod of the side pumping type. In this case, the method of BARNES does not work efficiently in the monitoring of the fluorescent light. In contrast, the method of the present invention in which an optical component is arranged in the

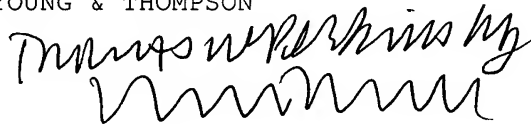
vicinity of an end surface of the laser rod in such a manner so as not to block the laser optical axis works appropriately and is effective.

In view of the present amendment and the foregoing remarks, it is believed that the present application has been placed in condition for allowance. Reconsideration and allowance are respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read 'Thomas W. Perkins', written over a horizontal line.

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